



*The Proceedings*  
OF  
THE INSTITUTION OF  
ELECTRICAL ENGINEERS

FOUNDED 1871: INCORPORATED BY ROYAL CHARTER 1921

ISSUED IN THREE PARTS AS FOLLOWS:

Part A. POWER ENGINEERING (*February, April, etc.*)

Part B. ELECTRONIC AND COMMUNICATION ENGINEERING (INCLUDING RADIO ENGINEERING)  
(*January, March, etc.*)

Part C. INSTITUTION MONOGRAPHS (*March and September only*)

PART A  
POWER ENGINEERING

VOLUME 108, 1961

PUBLISHED BY THE INSTITUTION, SAVOY PLACE, LONDON, W.C.2



	PAGE		PAGE
Discussion before the Supply Section; the North-Eastern Centre; and the North-Western Supply Group ..	323	<b>Electricity Supply in India and its Future.</b> Manoranjan Datta, M.Sc.Tech., Ph.D. ..	497
<b>The Mathematical Basis of the Absolute Calibration of Voltage Dividers for the Measurement of Front-Chopped Impulse Waves.</b> M. Ouyang, B.Eng., Ph.D. ..	327	Discussion on 'The Logical Design of Electrical Networks using Linear Programming Methods', before the North-Western Supply Group ..	504
<b>Automatic Check Synchronizing Equipment using Static Relaying Principles.</b> Colin Adamson, D.Sc., M.Sc.(Eng.), and O-P. Mosland, M.Sc.Tech. ..	331	<b>Technical and Economic Aspects of the Supply of Reactive Power in England and Wales.</b> W. Casson, and H. J. Sheppard, B.Sc. ..	507
<b>A General Theory of Depreciation of Engineering Plant.</b> D. Rudd, B.Sc.(Eng.) ..	341	Discussion before the following:	
Discussion before the Supply Section ..	350	The Institution ..	518
Discussion on 'Speed-Changing Induction Motors: Further Developments in Pole-Amplitude Modulation', before the Western Centre ..	356	North-Eastern Centre ..	521
<b>Speed-Changing Induction Motors: Reduction of Pole Number by Sinusoidal Pole-Amplitude Modulation.</b> Prof. G. H. Rawcliffe, M.A., D.Sc., and W. Fong, Ph.D. ..	357	Sheffield Sub-Centre ..	522
<b>A General Method of Digital Network Analysis particularly suitable for Use with Low-Speed Computers.</b> M. N. John, B.Sc.	369	<b>The Calculation of the Magnetic Field of Rotating Machines. Part 2: The Field of Turbo-Generator End-Windings.</b> D. S. Ashworth, B.A., and P. Hammond, M.A. ..	527
<b>Digital Computers in Power System Analysis.</b> P. P. Gupta, Ph.D., B.Sc., and Prof. M. W. Humphrey Davies, M.Sc. ..	383	<b>The Magnetic Field of the End-Windings of Turbo-Generators.</b> P. J. Lawrenson, M.Sc. ..	538
Discussion on the above two papers before the Supply Section ..	398	Discussion on the above two papers before the Supply Section ..	549
<b>The Fundamental Characteristics of Pilot-Wire Differential Protection Systems.</b> J. Rushton ..	409	Discussion on 'The Impulse Strength of Fully-Impregnated-Paper Dielectrics as used in High-Voltage Cables', before the North-Western Centre ..	554
<b>A Dynamic Model for Studying the Behaviour of the Overhead Equipment used in Electric Railway Traction.</b> D. S. Farr, H. C. Hall, M.Sc., and A. L. Williams, Ph.D., M.Sc. ..	421	<b>Objective Methods of Assessing Commutation Performance.</b> J. Hindmarsh, B.Sc.(Eng.), and N. K. Ghai, B.Sc.(Eng.), M.Sc.Tech. (Communication) ..	555
Discussion before the Utilization Section ..	431	Discussion on 'The Characteristics and Protection of Semiconductor Rectifiers', before the West Wales (Swansea) Sub-Centre ..	558
<b>The Place of Formal Study in the Post-Graduate Training of an Electrical Engineer.</b> N. N. Hancock, M.Sc.Tech., and P. L. Taylor, M.A. ..	435	<b>An Experimental Effective Value of the Quadrature-Axis Synchronous Reactance of a Synchronous Machine.</b> R. E. Steven, B.Sc., Ph.D. ..	559
Discussion before The Institution and before the North-Western Centre ..	441	<b>Recent Developments in Magnetic Work-Holding Devices for Machine Tools</b> (Communication). J. C. Jones ..	566
Discussion on 'Thermistors, their Theory, Manufacture and Application', before the Mersey and North Wales Centre ..	446	Discussion on 'Submersible Pumping Plant', before a Joint Meeting of the North-Western Centre, the Mersey and North Wales Centre and the South-East Scotland Sub-Centre ..	572
Discussion on 'Water-Turbine-Driven Induction Generators', before the Rugby Sub-Centre and the North-Eastern Centre ..	447	Discussion on 'Some Considerations in the Application of Power Rectifiers and Convertors', before the South Midland Supply and Utilization Group and the North Staffordshire Sub-Centre ..	575
Discussion on 'The Influence of Consumers' Load/Consumption Characteristics on Metering Practice' ..	449	Discussion on 'The Shielding of Overhead Lines against Lightning', before the North Staffordshire Sub-Centre and the Western Supply Group ..	577
Discussion on 'Electricity in the Manufacture of Hydrogen Peroxide', before the North Midland Utilization Group ..	451	Discussion on 'The Application of Irradiation in Industry', before the Northern Ireland Centre and the South Midland Supply and Utilization Group ..	578
<b>Progress in Oil-Filled Cables and their Accessories.</b> A. N. Arman, Ph.D., F. J. Miranda, Dr.Eng., and G. R. Bishop ..	453	Discussion on 'The Application of Low-Pressure Resins to some High-Voltage Switchgear Designs', before the South Midland Supply and Utilization Group ..	578
<b>The Influence of Ageing on the Characteristics of Oil-Filled Cable Dielectric.</b> P. Gazzana-Priaroggia, Dr.Eng., G. L. Palandri, Dr.Eng., and U. A. Pelagatti, Dr.Chem. ..	467	Monographs published individually ..	172, 272, 339, 452, 580
Discussion on the above two papers before the Supply Section and the Southern Centre ..	480	Index ..	581
Discussion on 'Magnetohydrodynamic Generation of Electricity' (Supply Section Discussion Meeting) ..	491		
Discussion on 'Open-Circuit Noise in Synchronous Machines' ..	495		

## PAGES IN PART A, 1961

Pages	No.	Month
1-76	37	February
77-172	38	April
173-272	39	June
273-340	40	August
341-452	41	October
453-580	42	December

**Declaration on Fair Copying.**—Within the terms of the Royal Society's Declaration on Fair Copying, to which The Institution subscribes, material may be copied from issues of the *Proceedings* (prior to 1949, the *Journal*) which are out of print and from which reprints are not available. The terms of the Declaration and particulars of a Photoprint Service afforded by the Science Museum Library, London, are published in the *Journal* from time to time.

**Bibliographical References.**—It is requested that bibliographical reference to an Institution paper should always include the serial number of the paper and the month and year of publication, which will be found at the top right-hand corner of the first page of the paper. This information should precede the reference to the Volume and Part.

**Example.**—SMITH, J.: 'Overhead Transmission Systems', *Proceedings I.E.E.*, Paper No. 5001 S, December, 1960 (107 A, p. 1234.)